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courses. The book is concise in its presentation of the subject and logical in its arrangement, it supplies exactly the need for a text in a short semester course in botany. It also lends itself well to expansion, as the reviewer has used the earlier editions, by means of supplemental lectures on the evolutionary development of plants, genetics, etc., and laboratory exercises.

This new edition has an increase of ninety pages and forty-three new illustrations have been inserted; adequate illustration is a most important feature in a scientific text-book. Chapter I. has been greatly extended so as to cover the chief methods of microtechnique. This is a practical aid to the student if a laboratory course is given in conjunction with the text-book work. Chapters II. and III. dealing with the alternation of generations and the life histories of the fern and pine, are essentially the same as in the preceding editions except that the illustrations are better, especially the reproductions of the microphotographs of sections. In Chapter IV. the treatment of the angiosperms, with *Erythronium* as a type, is expanded and additional illustrations inserted. Chapter V. entitled Vegetable Cytology is comprehensive to a degree. Mitosis and the morphology of a plant cell are adequately presented as well as a discussion of the modes of reproduction in plants. The section dealing with non-protoplasmic cell contents is especially detailed for such a general text and treats admirably the principal plant products as sugars, starches, glucosides, alkaloids, oils, gums, pigments, etc., with short tests for identifying specific substances as cocaine, veratrine, asparagine, caffeine, salicin, hesperidin, etc., which supplies the needs of pharmacy students in this respect and emphasizes the economic importance of many plants for the general student.

While in its use as a general text it may be rather deficient in the presentation of botanical physiology an attempt is made in this edition to overcome this criticism by a discussion, under the head of Protoplasm and its Properties, of the elements of organic function. Various tropisms are considered

and reference is made to the recent work of Steckbeck on sensitive plants. Chapters VI. and VII. represent the histological and anatomical section of the book. The treatment of plant tissues and organs, as roots, stems, leaves, flowers, is thorough and complete, and while reminiscent of that old and useful general text, Gray's *Lessons in Botany*, is quite modern in its presentation. The concluding Chapters VIII. and IX. cover the subjects of taxonomy and ecology. The latter subject is presented in four pages but the chapter on classification is very complete with regard to plants used in *materia medica*. Only the medicinal plants of each order or family are considered, the official name, the botanical name, the part of the plant used and the habitat being given in each case. The illustrations of these plants are especially helpful. If, however, the book is used as a general text a regular manual or flora could easily be substituted as a reference for that portion of the course in lieu of this pharmaceutical taxonomy.

Although the book was primarily written for pharmacy students, and is used by the reviewer for such students, the broad scope and the diverse phases of botanical science presented in a convenient and orderly manner commend it equally well to teachers as a general text.

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SPECIAL ARTICLES

TWO LIMESTONE FORMATIONS OF THE CRETACEOUS OF TEXAS WHICH TRANSGRESS TIME DIAGONALLY

SOME thirty-five years ago the existence of two great series of Cretaceous formations in the Texas region was pointed out by the writer, and it was shown that each of these—the Gulf and the Comanche Series—represented a cycle of sedimentation which culminated in relatively deeper water formations, known now as the Edwards Limestone and Austin Chalk respectively.

Observations of the past few years during

which I have been permitted to return to Texas and renew the studies of these formations, have shown that the lithologic aspect of each instead of representing definite and fixed time positions in their horizontal extent, moves upward through the geological column as it is respectively traced east or west from the locality of the standard section in Central Texas, as is shown on the accompanying diagram table. The position of the Austin Chalk ascends to the eastward from Central Texas towards northeast Texas and Arkansas, where it is known as the Anona Chalk, and Alabama, where it is called the Selma.

The Austin Chalk in the course of this ascent practically continues from the Niobrara to the Ripley or near Fox Hills stage of the time column, and is accompanied by corresponding changes in its fauna. This transgression of the Austin Chalk has recently been noted by my associate Mr. J. E. Brantly in a recent report on the oil fields of Alabama, published by the State Geological Survey of that state.

Recently while studying the geology of the Fort Stockton Country in Pecos County, Texas, the writer observed a similar instance of transgression by the Edwards limestone. In this instance both the lithologic and paleontologic facies of the Edwards limestone formation, which occupies a fixed position in the geologic column in Central Texas, is found to have transgressed through time diagonally until it occupies a higher and altogether different one in the vicinity of Fort Stockton, as it is traced to the westward from Austin towards the east front of the Cordilleran Ranges. This formation in both localities largely consists of cellular and semi-chalky white limestones which weathers gray and yellow, accompanied by a characteristic fauna of fossil species (Rudistes, corals, echinoderms, etc.).

In the typical Central Texas section heretofore described the Edwards limestone and its fauna occur in a definite position below the Kiamitia and Duck Creek formation. In the vicinity of Fort Stockton where it occurs as the cap rock of extensive areas, it was

DIAGONAL TRANSGRESSION OF THE EDWARDS LIMESTONE AND AUSTIN CHALK

Edwards Limestone					Time	Austin-Anona Chalk			
Locality						Locality			
Mexico	Stockton	Crockett	Austin	Fort Worth		Central Texas	N.E. Texas, Louisiana, Arkansas	Alabama,	
		×		×	Gulf Series, Navarro-(Ripley)			×	
					Taylor-(Pierre)			×	
					Austin-(Niobrara)	×		×	
					Eagle-Ford (Benton)				
					Woodbine (Dakota)				
					Comanche-Series, Buda				
					Del Rio				
					Georgetown				
					Duck Creek				
					Kiamitia				
				×	Goodland				
					Walnut				
					Paluxy				
					Glen Rose				
					Trinity				

found with the same lithologic aspects and fauna as in Central Texas, but its stratigraphic position was found to be above the Georgetown Duck Creek and Kiamitia formations and faunas, instead of below them, as it normally occurs in the Central Texas sections.

The only hypothesis I have to offer for these peculiar conditions is that during the two epochs similar conditions of depth and environment must have continued with shifting location as time progressed, but at present I can not explain why the fauna of the Austin-Anona Chalk changed with this transgression while that of the Edwards persisted.

This fact may have important bearing upon the correlation of the Texas Cretaceous sections with those of Mexico, and assist in the interpretation of the as yet but little understood formations of the latter county.

ROBERT T. HILL

DALLAS, TEXAS

THE AMERICAN MATHEMATICAL SOCIETY

THE twenty-seventh annual meeting of the society was held at Columbia University on Tuesday and Wednesday, December 28-29, with the usual